

Space News **ROUNDUP!**

Vol. 4, No. 9

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

February 17, 1965

Two From MSC Win 1965 Flemming Awards

Two men from the Manned Spacecraft Center were among the ten winners of the 1965 Arthur S. Flemming Award that is given each year to outstanding young men in the federal government.

The awards are presented by the U. S. Junior Chamber of Commerce. Five awards were presented to men in scientific and technical fields and five in administrative or executive fields.

Dr. Joseph F. Shea, 38, Manager, Apollo Spacecraft Program Office, and Wesley L. Hjernevik, 38, assistant director for Administration, were presented the awards last Thursday at an awards luncheon at the Statler Hilton Hotel in Washington, D. C., along with eight other government employees.

Three others receiving the award were also connected with the space program. They were: Leonard Jaffe, NASA director of Communications and Navigation Programs; Dr. Robert Jastrow of the Goddard Institute

for Space Studies; and Dr. George W. Sutton, scientific advisor to the USAF Directorate of Development Plans.

Principal speaker for the occasion was Secretary of Labor W. Willard Wirtz.

Dr. Shea's participation as head of the study group to decide which of three possible approaches should be used for the U. S. manned lunar landing and to examine management considerations for each approach, earned him the award.

Hjernevik was presented the award for his part in construction of the Manned Spacecraft Center laboratory facilities for space environment simulation.

Three past winners of the Arthur S. Flemming Award are also here at the Manned Spacecraft Center.

In 1960 Maxime A. Faget, assistant director for Engineering and Development, received the Arthur S. Flemming Award.

Recipients in 1963 included George M. Low, deputy director, MSC, who was at that

time deputy director, Office of Manned Space Flight (Programs), NASA Hq.; and Christopher C. Kraft Jr., assistant director for Flight Operations.

Other winners of the Flemming award were Dr. Eugene Barunwald, Eugene P. Foley, Thomas L. Hughes, Daniel Patrick Moynihan, and Paul A. Volcker.

To be eligible for the award the recipient must be under 40 years of age.

The winners were selected principally for their work during fiscal year 1964, and were chosen by a panel headed by Associate Justice Arthur J. Goldberg of the Supreme Court.



DR. JOSEPH SHEA



WESLEY HJORNEVIK

Cooper, Conrad: GT-5 Prime Crew

The crews for the fifth Gemini flight were named February 8 at the Manned Spacecraft Center with Astronauts L. Gordon Cooper Jr. and Charles Conrad Jr., being named as the prime crew for the scheduled seven day mission.

Backup crew for the flight will be Astronauts Neil A. Armstrong and Elliot M. See Jr., both civilians with previous military service.

Cooper who will be the command pilot, is an Air Force

major and Conrad is a lieutenant commander in the Navy.

This flight is to be the longest flight that has been scheduled and would be longer than any ever flown by the Russian cosmonauts. Their longest flight was flown by Valery F. Bykovsky with 81 orbits in five days.

Charles Mathews, Gemini Program manager, said 20 experiments are planned for this flight which is scheduled for the latter part of this year.

Cooper has logged over 34

hours in spacecraft, which is more than all the American astronauts combined. However, this record may be broken later this year by the GT-4 crew, James A. McDivitt and Edward H. White II, whose flight is scheduled to last for up to four days. Their backup crew is Frank Borman and James A. Lovell Jr.

Both crews for the GT-5 flight are the same age. Cooper is 37 and Conrad is 34. Armstrong is 34 and See is 37.

Employees Awarded \$950 For Beneficial Suggestions

Cash awards totaling \$950, and certificates were presented to thirteen MSC employees February 10, by Paul E. Purser, chairman of the Incentive Awards Committee.

These awards were made for beneficial suggestions approved for adoption by the MSC Suggestion Subcommittee. Supervisors, division/office chiefs, and members of the Suggestion Subcommittee were present at the ceremony.

Recipients of \$15 awards were: Elena M. Cardenas, Flight Control Division, for her suggestion that MSC Form 752, Data Sheet, be revised; Saverio

Gaudiano, Instrumentation and Electronic Systems Division, for his suggestion that MSC library clerical support be used to duplicate reference material rather than the requesting engineer; and Daryle E. Roth, Personnel Division, for his suggestion that classification program maintenance Survey lists be machine printed.

Recipients of \$25 awards were: Marilyn J. Bocking, office of the Deputy Director, for her suggestion that slides be color coded for security purposes; Garnette M. Bach, Advanced Spacecraft Technology Division, for her suggestion that MSC telephone switchboard operators and travel reservation clerks wear microphone-receiver headsets; and Thomas J. Linbeck, Mission Planning and Analysis Division, for his suggestion that a handrail be placed by the mail-cart ramp between buildings 30 and 12.

Campbell P. Canup, Technical Services Division, was presented \$35 for his suggestion for a safety device for right-angle drill motors.

Recipients of \$60 awards were: Don N. Bateman, Photographic Division, for his suggestion that slide masks be manufactured as are horizontal

(Continued on Page 3)



SEVEN-DAY GT-5 CREW—The crews for the fifth Gemini flight were named February 8 at the Manned Spacecraft Center. They are (l. to r.) Astronauts Elliot M. See Jr., pilot, backup crew; Neil A. Armstrong, command pilot, backup crew; Charles Conrad Jr., pilot, prime crew; and L. Gordon Cooper Jr., command pilot, prime crew. The flight is scheduled as a seven-day mission for later this year.

Next Monday Legal Holiday

Next Monday, February 22 is a legal holiday celebrating the birthday of George Washington, and all offices here at the Manned Spacecraft Center will be closed.

Center employees will be excused from duty without charge to leave or loss of pay except those having duties considered essential for operations.

Employees required to work on the holiday are to be notified as far in advance as possible by their supervisors.

Exercises Open To News Media Representatives

GT-3 Crews Perform Parachute And Egress Training

The prime and backup crews for the upcoming flight of the Gemini-Titan 3 three-orbital mission were viewed and interviewed by local and national news media representatives early this month as they went through parachute and egress training exercises.

This was to be the last time these astronauts were to be available for interviews by the press due to the rigorous training schedule confronting the crews prior to the GT-3 flight. That flight is scheduled for the second quarter of this year.

Astronauts taking part in the exercises were Virgil I. Grissom and John W. Young, prime crew; Walter M. Schirra Jr. and Thomas P. Stafford, backup crew for the GT-3 mission.

Parachute training, with the astronauts in space suits, was conducted in Galveston Bay, with Byron Adams of Flight Crew Support Division serving as project engineer. Participating in the training exercise from Shell Island in the Bay, were Astronauts Schirra, from the GT-3 crew; Edward H. White II and James A. Lovell Jr., from the GT-4 crews. Stafford did not take part in the exercise because of a slight cold. Grissom and Young were also scheduled for the training exercise but bad weather forced a cancellation on two different occasions. They will make up the training later.

Billie Drummond, head of the Parachute Support Section, Technical Services Division, along with Coy Martin and N. A. Verdon, prepared the parachutes for the exercise and supplied ground support on the island.

Medical monitor for the parachute portion of the training exercise was Dr. Samuel C. Puma, Flight Medicine section of the Center Medical Office.

SCUBA divers assisting in the Parachute training exercises in the Bay as well as the egress training in the tank in Hangar 135, at Ellington, were Lamarr D. Beatty and Jerry H. Fleming, both of the Field Test Branch, Technical Services Division. Charlie Rogers, head, Installation Machinists Section of Technical Services, was in charge of the SCUBA diver portion of the exercise.

Gordon W. Harvey, Spacecraft Operations Branch of the Flight Crew Support Division, is in charge of mission training exercises for the crews that are assigned to specific flights.

Dr. Howard A. Minners, head of the Flight Crew Effectiveness Branch, Center Medical Office, was the medical monitor in attendance for the egress training exercise.

The egress training from a spacecraft in the water was conducted in a large tank in Hangar 135 at Ellington AFB. Astronauts Grissom, Young, Schirra, and Stafford all took part in this exercise. Harvey directed this portion of the training in the tank.

Using a crane and an overhead lift, Lyman O. Lee, head of Rigging Support Section, Technical Services Division, and his crew Charlie Vernon and Herald Whitmer, maneuvered the spacecraft into various positions for egress training in the tank. Used in the training exercise were spacecraft boilerplate 201 and Static Article Five. The boilerplate spacecraft was used for the underwater portion of the egress training.

Additional mission training exercises for the GT-3 crews will be conducted here and at the Cape, with support being supplied by the same MSC people taking part in this exercise.



PREPARING FOR EGRESS EXERCISE—Astronauts Virgil I. Grissom and John W. Young, prime GT-3 crew, prepare to enter the Gemini spacecraft in a tank at Ellington AFB, where egress exercises were performed as news media representatives observed. Lining the tank were representatives of national news media, local members of the press, radio and television, along with NASA support people.



EMERGENCY EGRESS TRAINING—Astronaut John W. Young, pilot for the GT-3 flight is shown as he makes an underwater egress from the submerged Gemini boilerplate spacecraft in a tank at Ellington AFB.

Escape System For Gemini Qualified In Test Simulations

One of the final series of qualification tests of the two man Gemini spacecraft's seat ejection escape system was successfully accomplished by the National Aeronautics and Space Administration February 12 at the U.S. Naval Ordnance Test Station, China Lake, Calif.

Conducted under the management of NASA's Manned Spacecraft Center, these final tests will qualify the system for Gemini space flights, the first of which will be piloted by Astronauts Virgil I. Grissom and John W. Young.

The test simulated a pad abort condition. The boilerplate engineering test vehicle was mounted atop a 150 foot tower equal in height to the Titan 2 launch vehicle.

The side by side ejection seats were thrust out and away from the test vehicle to an altitude of about 350 feet and the mannequins landed by parachutes approximately 850 feet down-range.

Witnessing the test were Hilary Ray, systems engineer for MSC and Astronaut Alan L. Bean.

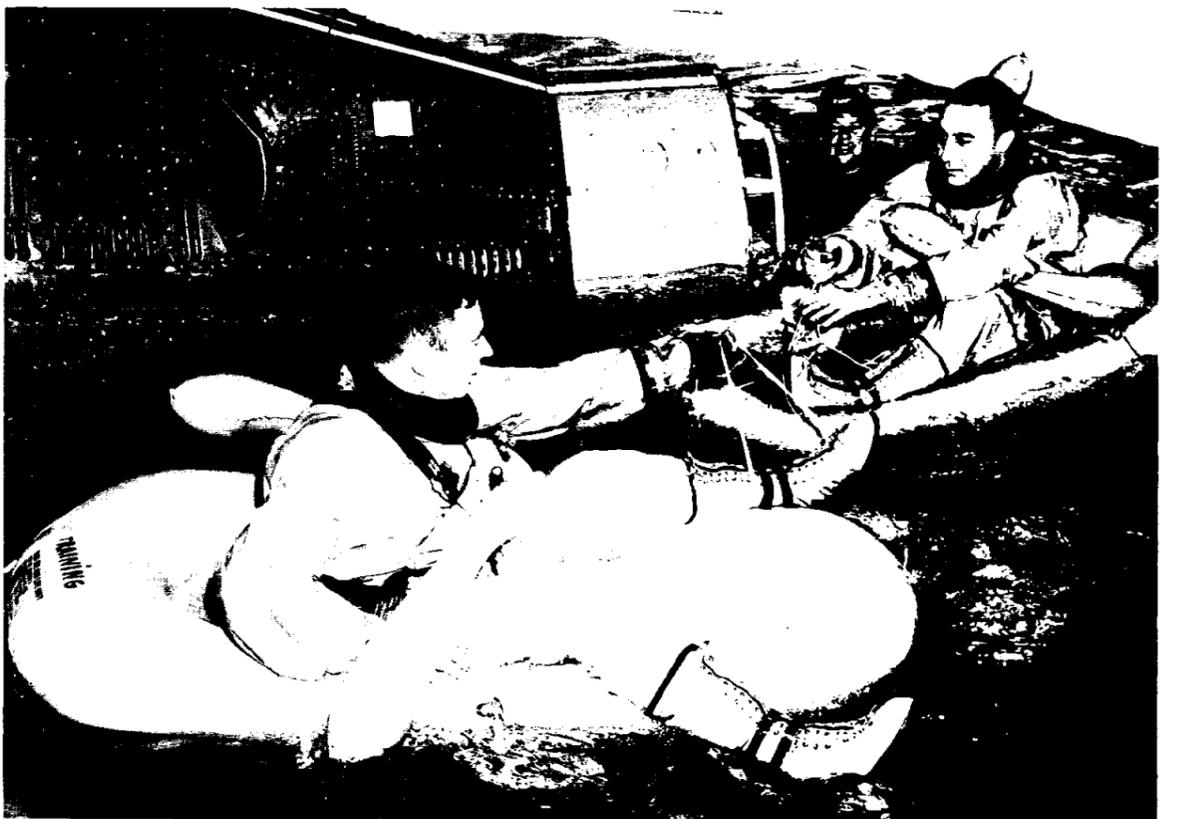
Ray who was in charge of

today's test said, "From visual observation everything looked to be 100 per cent perfect. We expect evaluation of films and other data will confirm this visual observation."

Production models of the escape system are now at Cape Kennedy and will be installed in the Gemini spacecraft which will orbit Astronauts Grissom and Young.

Prior to last week's test, the twin ejection seat system was subjected to more than 100 qualifying tests which included high speed track runs, high altitude ejections and other pad abort tower tests.

The Gemini escape system is designed and built for NASA by Weber Aircraft Co., of Burbank Calif., under subcontract to McDonnell Aircraft Corp., the prime contractor for the Gemini spacecraft.



IN SURVIVAL RAFTS—The prime crew for the GT-3 flight, astronauts John W. Young, pilot, and Virgil I. Grissom, command pilot, are shown in their life rafts after having egressed from the Gemini static article five in a tank in Hangar 135 at Ellington AFB.

'Ladies Night' Set For Tonight

A special "MSC Ladies Night" to acquaint the women employees of the Center with the MSC organization, and progress and goals of the Gemini and Apollo programs, is scheduled for 6:30 p.m., tonight in the Building 1 Auditorium.

Informal discussions will be presented by George M. Low, deputy director, MSC; Charles

W. Mathews, manager, Gemini Program Office; and Dr. Joseph F. Shea, manager, Apollo Spacecraft Program Office. The latest MSC quarterly film report depicting recent accomplishments in NASA's manned space flight program will be shown.

The ladies night program was originally scheduled for last Wednesday but was postponed.

Federal Accountants To Meet March 2

A meeting of the Houston Chapter of the Federal Government Accountants Association will be held on March 2, with John R. Croxall, assistant director of Financial Management for Systems, NASA Headquarters, as the guest speaker.

The program will begin at

8:00 p.m. preceded by a social hour at 6:15 and dinner at 7:00 in Wilbur Clark's Crest Hotel

The topic of Croxall's speech will be "Financial Management - The Crucible."

For reservations, call Les Thorn at Ext. 7771 by noon, March 1.

New Visitor Badges Revised To Conform To NASA-MSC Color Clearance Codes

The MSC visitor badge has been revised to conform with the clearance color codes presently in use on the new NASA ID badges, along with other revisions which will make the badge more effective and permit additional uses for the badge, it was announced by the MSC Security Division.

A red border indicates the wearer has a secret clearance; a blue border indicates a confidential clearance; and a black border indicates no clearance.

The face of the new badge will show the visitor's name, employer, expiration date, and areas or buildings which the visitor is permitted to enter without escort. Only authorized

Security employees may indicate building numbers on visitor badges.

In order for a visitor to be authorized in a building at MSC, either the building number must be shown on the badge, or he must be escorted by a person who has a badge which is valid for the area concerned.

All employees are responsible for challenging visitors not meeting either of these requirements.

The visitor badge will also be issued to the MSC or contractor employee who has forgotten or lost his badge. In this case, the area codes entered will be identical with those appearing on the employee's permanent badge and the wearer will be permitted entry on the same basis as if he were wearing a permanent type badge.

Awards

(Continued from Page 1)

ones, and that the same system and material be used with changes in the dimensions; and Voula Tsitsera, office of the Special Assistant to the Director, for her suggestion that MSC use Minuteman magnetic hangers for hanging pictures, etc. on the steel walls.

William R. Ball, Technical Services Division, was awarded \$175 for his suggestion that pertain to quick changing of different amperage or body type welding torches.

Joyce A. Priode and Joseph G. Schisser of the Logistics Division, and Wayland J. Rippstein of Crew Systems Division, shared \$500 for their co-suggestion that contaminated mercury be decontaminated, triple distilled, and stored in non-corrosive containers.

These suggestions have resulted in tangible first-year savings of \$17,838 and intangible benefits in the areas of safety, efficiency, and security.

In a recent speech at Constitution Hall observing the tenth anniversary of the Government Employees Incentive Awards Program, President Lyndon B. Johnson cited a new record number of 118,500 employee suggestions which were adopted through the incentive program last fiscal year. "Now I want to see another new record set in the coming 12 months," he said. "I have faith in you and I trust you, and I believe in you. Therefore, I just know you will do it.

"I am asking for your help. I am asking for your cooperation. I am asking for your very best effort. And you will have the gratitude of your country and the gratitude of your President," he promised.

The Incentive Awards Committee expressed hope that every Manned Spacecraft Center employee will respond to the President's challenge.

Employees may contact the Incentive Awards coordinator or the Incentive Awards Office, Ext. 3761, for assistance and further information.

Revision of the visitor badge will make it easier for MSC employees to identify visitors and determine whether or not entry into a building or area is authorized.

GT-3 Spacecraft Undergoing Tests At Cape Kennedy

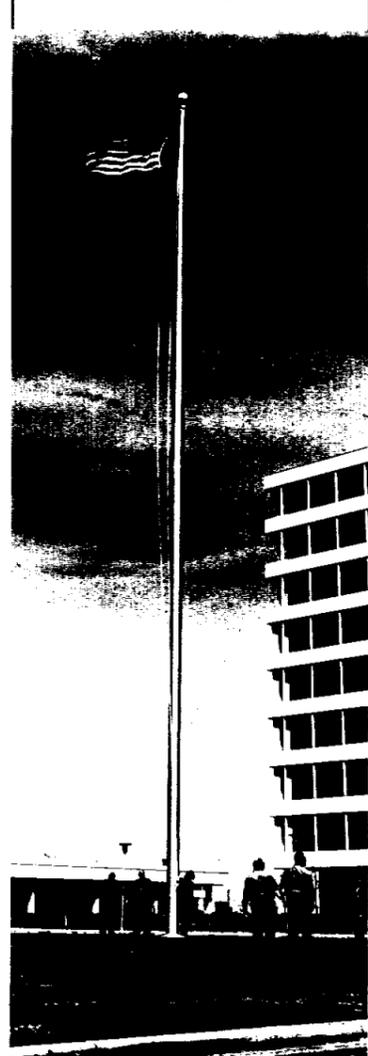
Gemini spacecraft No. 3, in which two men will orbit the earth, is at Cape Kennedy's launch complex 19, where it is undergoing a series of tests before being mated to the launch vehicle.

The spacecraft was delivered to the pad from the pyrotechnic facility on Merritt Island, February 4. It was then hoisted to the super-clean "white room" and placed on a tripod adjacent to the top of the launch vehicle.

It will remain on the tripod during a series of pre-mate verification and interface tests. The spacecraft is expected to be mated to the launch vehicle the latter part of this month.

Astronauts Virgil I. Grissom and John W. Young will pilot the spacecraft on its three-orbit journey this spring.

New Flagpole



FLAGPOLE FOR MSC—This 80-foot tall spun aluminum flagpole was installed Monday in front of Building 2, the Project Management Building, and will be used to fly the U. S. Flag here at the Manned Spacecraft Center. The Baartol Company supplied the pole and Graham Engineering Company installed it. The installed cost of the flagpole was about \$2400.



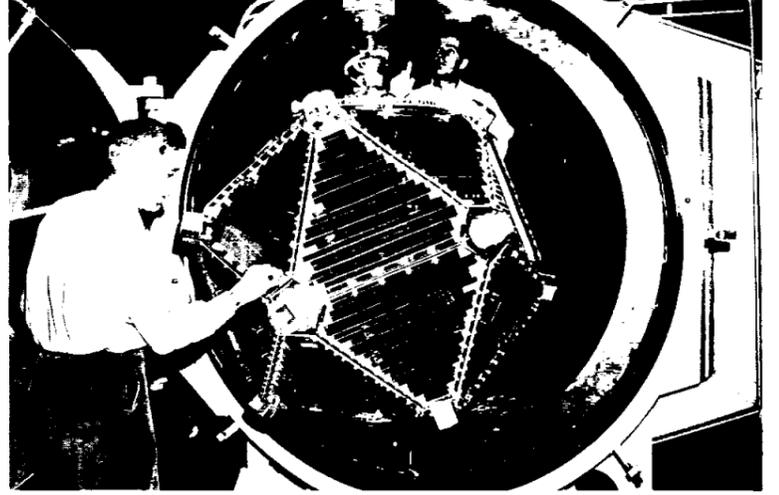
EGRESS BP 201—Astronauts Walter M. Schirra and Thomas P. Stafford are shown during an egress training exercise in the tank at Ellington AFB. They are the backup crew for GT-3 flight.



PARACHUTE TRAINING—Astronaut Walter M. Schirra Jr., command pilot for the GT-3 backup crew, is shown after he was picked up by NASA SCUBA divers Lamarr D. Beatty and Jerry H. Fleming, from a parachute landing in the waters of Galveston Bay.



HEADQUARTERS TRW/STL—Aerial view of TRW Space Technology Center at One Space Park, Redondo Beach, Calif. In the foreground are facilities for data reduction, computing, research and development activities. Building in the rear is for the manufacturing and testing of spacecraft.



PERFORMANCE TESTING—Nuclear detection satellite being installed in space simulator for continuous 168-hour performance test. During this test the spacecraft is held in a vacuum and exposed to simulated sunlight and temperatures as low as minus 300 degrees F.

TRW Space Technology Laboratories Map Space, Develop

TRW Space Technology Laboratories has the rare distinction of having been born with the missile/space age.

Created in 1954 to provide systems engineering support for the Air Force in the development of the U.S. Ballistic Missile Force, TRW-STL has since ventured beyond missile technology into nearly all aspects of space technology—from the design and production of such spacecraft as Pioneer, OGO and Vela, through supplying communications, telemetry and tracking electronics and space engines, to providing a wide variety of analysis and studies that include missions and trajectories for both manned and unmanned space projects.

Supporting these hardware and software activities is a broadly based contractor—and independently supported research program that ranges from space science experiments to studies of the interaction of particles within the nucleus of the atom.

The headquarters home of TRW Space Technology Laboratories is a modern, \$35-million complex of glass and steel laboratories and production centers located at Redondo Beach, Calif.

Within a radius of 75 miles of this site are TRW facilities in San Bernardino, headquarters for its integration and test support activities; in San Juan Capistrano, where 2500 acres of grazing land have been turned over to the testing of space engines; and in Malibu, where tests on the magnetic characteristics of space hardware are conducted.

Engineering staffs are maintained in Washington, D. C., Cape Kennedy, Fla., Huntsville, Ala., and, most recently, in

Houston, Tex. Here, on a 10-acre site, is growing another TRW complex to house the staff conducting studies and developments in support of MSC's projects Gemini and Apollo.

When the first astronaut lands on the moon, his roadmap into space will have been developed by TRW Space Technology Laboratories. His touchdown spot on the moon will have been selected from thousands of possible areas by high speed computers which simulate actual flights from a broad variety of descriptive data.

Typical of the information which would be included in the simulation are the location of the launch pads and desired landing sites (on the moon and then back on Earth for Apollo); characteristics of the launch vehicle and the spacecraft including weights, thrust, fuel utilization, and structural limits; atmospheric conditions including winds to be encountered during ascent and descent; the laws to be observed by the guidance system and limitations imposed for astronaut safety.

All of the data, together with the conditions prevalent on the date of the launch, are then used to derive mission strategies, pay-

load weight limitations, communication requirements and the many other factors which must be completely explored before the first manned vehicle is sent toward the moon.

This work being done for NASA's Manned Spacecraft Center in Houston for Apollo and Gemini, is a continuation of trajectory and guidance work done for all of the Mercury flights as well as for most of the major missile and space projects during the past ten years.

Among the many aspects of the Gemini mission which must be analyzed are the maneuvers to be made by the Agena target vehicle and the Gemini spacecraft during rendezvous experiments. From such analysis will be derived the actual mission strategy which can then be further tested by the simulation of flight events.

The Apollo studies cover preparation for the lunar landing mission and also concentrate in detail on the manned exploratory missions, preparing computer programs to be used during the actual flights, and analyzing features of the mission. The options which will be available to the astronauts in case of abort anywhere in the flight will be investigated to find the safest strategy. In all, the simulation

must consider all possibilities of success and failure and determine alternative actions to be taken.

Some of these actions must be programmed for inclusion in the ground and spacecraft computers. Finally, the work includes computer analysis of data collected during the tests and manned flights.

In addition to the trajectory and guidance work for Apollo and Gemini, TRW's participation in NASA's Apollo program was enlarged with the acquisition of several new contracts. Grumman Aircraft and Engineering Corporation awarded a contract to TRW-STL for the design and manufacture of a special micro-miniaturized guidance and control system to back up the primary guidance for the Lunar Excursion Module (LEM).

TRW has been selected to develop the descent engine for the Lunar Excursion Module. The LEM engine must be capable of sustaining a variable thrust long enough to hover and land the capsule safely on a pre-selected spot on the surface of the moon.

Moreover, since two astronauts will be sitting virtually on top of the engine during the landing maneuver, it must be the



DR. RUBEN F. METTLER
president TRW/STL



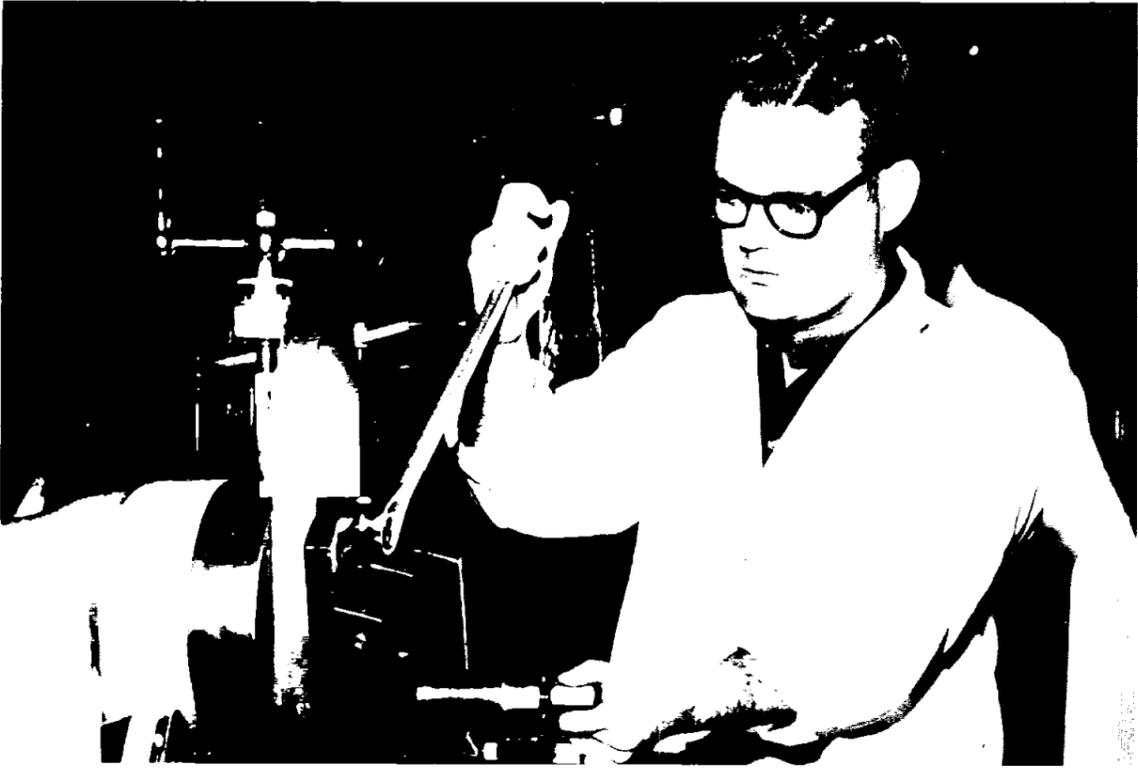
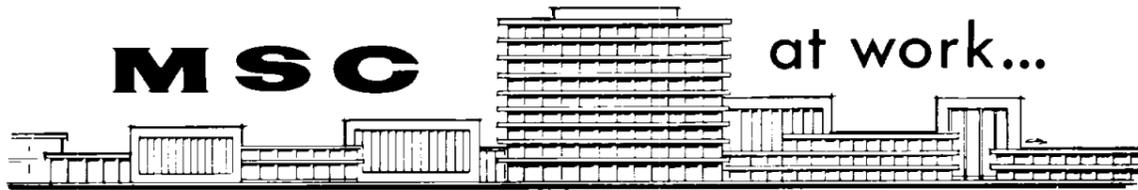
STL MACHINE SHOP—One of several machine shops at STL. Master machinists and the finest specialized machines together is a prime requirement for production of space "hardware."

EDITOR'S NOTE: This is the fortieth in a series of articles designed to acquaint MSC personnel with the Center's industrial family, the contractors who make MSC spacecraft, their launch vehicles and associated equipment. The material on these two pages was furnished by TRW Space Technology Laboratories.

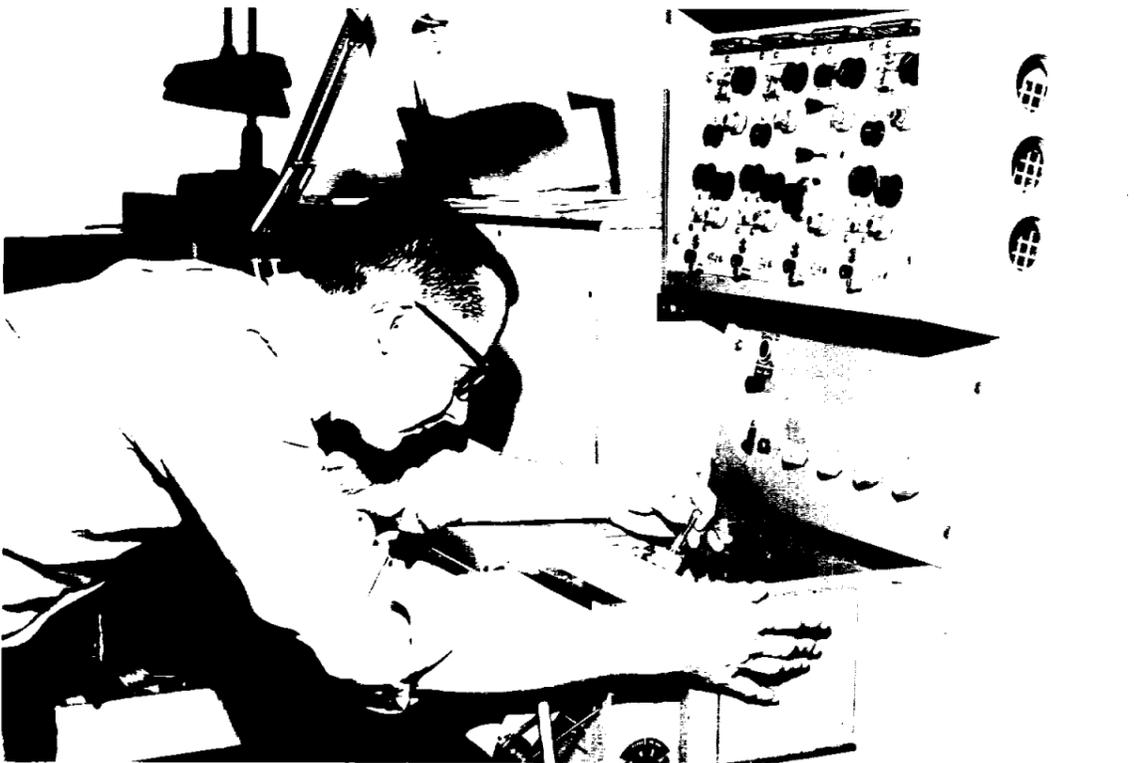


DATA REDUCTION CENTER—A large variety of data reduction equipment is available here including demodulators for telemetry data, conversion equipment and various types of display devices.

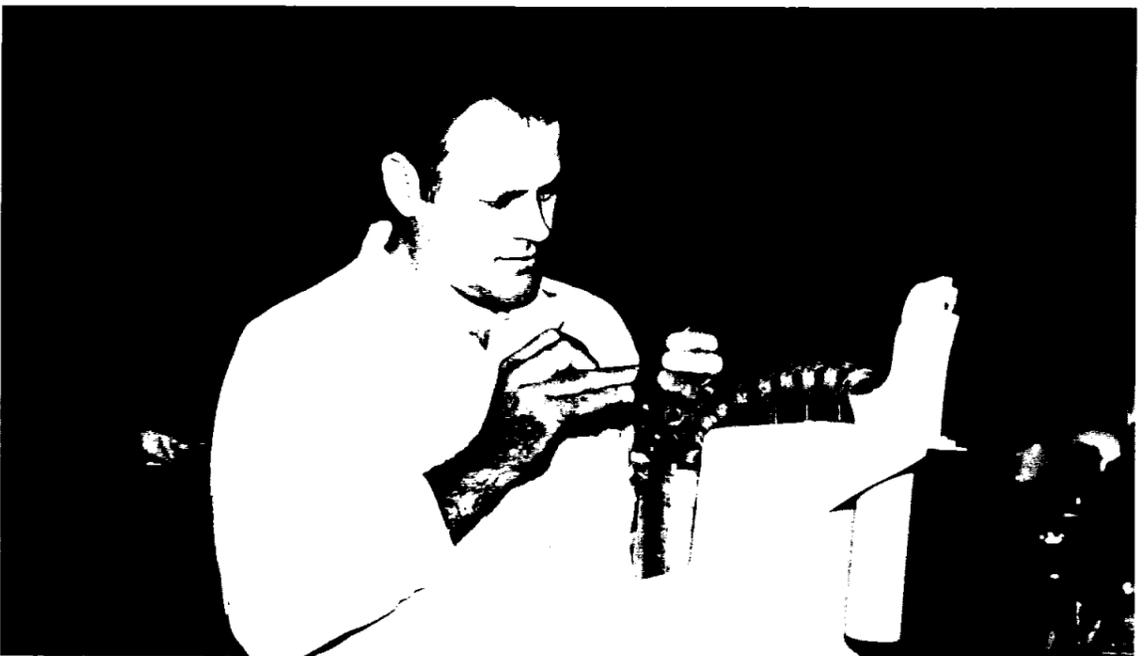
MSC at work...



JERRY D. ALLEN, apprentice machinist, Machine and Assembly Branch of the Technical Services Division, shapes a piece of aluminum for a Gemini liferaft systems container.



WILLIAM H. SIGAFOOSE, electronic instrument maker, Electronics Branch, Technical Services Division, is shown testing stylus pressure on a multiple channel heat recorder.



PERCY ALLISON, apprentice machinist, Model Shop Branch, Technical Services Division, works on a water management panel for Gemini.

Reservations Now Being Taken

Employees Las Vegas Trip Scheduled March 19-22

Reservations are now being taken for the long-planned flying trip to Las Vegas, Nev., with three nights of fun, return, all for \$160.

The flight for Las Vegas will leave Houston at 5 p.m., March 19 and return at noon March 22. The trip is open to MSC employees, their guests and contractor employees.

Included in the \$160 fee per person is the following: Air transportation Houston to Las Vegas and return; Transportation to and from the airport in Las Vegas; Room (twin beds, two to a room) Thunderbird Motel; Three buffets; Dinner show at Thunderbird, with cornish game hen entree; Late

show at another hotel; Cocktail of your choice upon arrival; Cocktail party, one-hour, for entire group; Behind-the-scenes tour of gambling casino at the Mint, downtown Las Vegas, with cocktail and souvenir; Baggage handling, based on two bags per person.

Reservations are on a first-come first-served basis and must be accompanied by a check for \$160. Mail your reservation and check to Mary Sylvia, chairman, Social Committee, Employees Activities Association, Code AR.

For additional information see your EAA district representative. Deadline for reservations is March 9.

Officers Elected, Reports Presented At Annual Credit Union Meeting

Three new directors were elected to serve on the board of the MSC Federal Credit Union at the annual meeting of members January 26 in the MSC Cafeteria, and officers for the coming year were named in the board meeting which followed.

Directors who were elected to three-year terms were: Burney Goodwin, I. E. Campagna, and William A. Milan. Paul Sturtevant was selected to fill the unexpired term of Jack Kinzler.

Officers named for 1965 are: Roy C. Aldridge, president; Burney Goodwin, vice president; I. E. Campagna, treasurer; and William A. Milan, secretary. Other board members are Robert J. Bailey, Thomas J. Cassias, George MacDougal, and James Stephens.

In further balloting at the annual meeting, the members re-elected Robert Stubblefield and Troy Williams to three-year terms on the Credit Committee. Ivan Nachman was selected to fill a vacancy existing on the Credit Committee. Abner Askew is the chairman, and Harold Ferrese is the remaining member of the Credit Committee.

The 57 members in attendance heard informative reports by R. J. Bailey, retiring vice president, speaking for the board; by Joseph P. Murray, manager, speaking for the Credit Committee; and by Ralph Rhodes, speaking for the Supervisory Committee.

A formal announcement was made of the 4.08 per cent dividend which was paid last year by the Credit Union.

Members attending the meeting were served sweetrolls and coffee by the Credit Union.

Moving Fast

NASA was only seven days old when it set up Project Mercury which ended May 16, 1963, with the safe return from 22 orbits of Astronaut L. Gordon Cooper Jr. The Mercury score: six flights and six successes.

Rod And Gun Club Schedules Two Meetings Next Week

The Rod and Gun Club here at MSC, has scheduled two meetings for next week, both to be held at 12 noon in Room 267, Building 16.

February 23, a competitive rifle meeting, and on the 24th, a hunting rifle and pistol meeting. Organization of these activities will be conducted and programs for the year, along with range activities, will be discussed.

Those interested in rifle or pistol shooting are urged to attend—visitors are welcomed.

The rifle team placed well in a recent individual match held at Texas City. Gordon Spencer fired at 387/400 to win the match, and C. Ritchie fired a 368/400 to win first place in the marksman class.

Currently the team is making plans to enter the Texas State Gallery Championships later

this month.

The team is also looking for more shooters to be able to enter a gallery league that is scheduled to start in April.

Anyone interested in 22-caliber rifle shooting should contact D. Bell at Ext. 4771, or G. Spencer at Ext. 4572 for additional information.

Spring Art Exhibit For MSC Employees Planned March 15-19

A Spring Art Exhibit is planned for the week of March 15-19 here at the Manned Spacecraft Center.

Exhibit material will include water color and oil paintings, prints and ceramics.

Interested persons may call Eugene Brock at Ext. 4788 for additional information.

Two Receive Performance Awards



SSP AWARDS PRESENTED—Sustained Superior Performance awards were presented recently to John B. Alldredge (left), contract specialist in the Gemini and Flight Support Branch of Procurement and Contracts Division; and Corinne Stoneking (right) secretary-typist, with the Telecommunications Branch, Office Services Division. Wesley L. Hjernevik (center), assistant director for Administration, made the presentations.

Ice Skating Party For MSC Youngsters Planned For Sunday, March 14, By EAA

The MSC Employees Activities Association has scheduled an ice skating party for MSC youngsters and friends from 1 to 3 p.m., Sunday, March 14.

It will be held at the Winterland Ice Rink, 2400 Norfolk (one block east of Kirby and Richmond) and children of all ages are invited. Children under 10 years of age must be accompanied by a parent.

Admission will be \$1 per person. This includes skate rental and refreshments. Hamburgers, soft drinks, doughnuts, and ice cream will be served.

Children, parents and guests

are asked to meet at the SAGE parking lot, 8555 Gulf Freeway, Exit 13, to board busses at 12:15 p.m., for the trip to the rink. Return to SAGE will be approximately 4:45 p.m. Participants may also drive directly to the skating rink if they desire to do so.

Ticket sales are currently limited to 250 persons and tickets may be purchased from your EAA district representative. The last skating party was an enjoyable success an EAA member stated.

For further information on the skating party, contact Paul Lieb-

hart, Ext. 5441, or Flora Byars, Ext. 3881.

Health Agencies Fund Drive Now Underway

The National Health Agencies and the Federal Service Joint Crusade annual fund raising campaign began this past Monday at MSC and will continue through April 1.

Goal of the campaign is 100 per cent participation with no dollar goals, quotas or pledges.

President Lyndon B. Johnson said in speaking of this campaign for funds, "To further the cause of human dignity and freedom, I urge all civilian personnel and members of the Armed Forces to contribute generously."

A sealable envelope will be provided each employee in which to place his gift.

Chairman of the 1965 campaign at MSC is Grace Winn.

High Participation Noted In WSO Bowling League

The Thursday night bowling league at White Sands Operations has become the largest employee participation activity and one of the first to be organized at the site.

Some 40 team bowlers and eight substitutes are listed on the White Sands NASA Mixed Bowling League's books.

The league was organized in December with James Winn of Support Engineering Office elected president, Hugh Fitzgerald of SEO named vice president, Margaret Morgan of the manager's office elected secretary, and Paula Gantz, wife of Propulsion Engineering Office chief, B. R. Gantz, treasurer.

A 16-week schedule has been set for the league which began in January and will run through April 29.

EAA Questionnaire To Seek Preference Of Activities For Employee's Children

What kind of activity would your son or daughter like to take part in, will be a question asked by a questionnaire from the Employees Activities Association Children's Activities Com-

mittee.

Would they rather go to a swimming party, a roller skating party, take a trip to the planetarium, go to the zoo, or perhaps have a "sock hop?"

The Children's Activities Committee needs answers to help plan future events and the activities planned will be primarily based on the results of the census questionnaire.

E. H. "Tony" Yeater has been asked by the committee to conduct the census during the second week of March to discover the answer to this and several other questions.

Parents are asked to talk to their children about their preferences, fill out the questionnaire and return it to Yeater by March 12.

Ellington Officials Ask Cooperation In Base Parking

Ellington AFB officials have asked the cooperation of MSC and contractor employees in the use of the parking lot in front of the Officers' Club.

They advised that the west side of the parking lot is reserved for club patrons.

Duplicate Bridge Master Point Game Results Announced

The February 2 Duplicate Bridge Club Master Point Game brought out a record crowd of seventeen tables.

Section A winners: North-South, Max Cone and John Stanfield, first; Sara and William Stewart, second. East-West, Richard Reid and Robert Kidd, first; Emer St. Leger and Rita O'Boyle, second. Section B: North-South, Brian Conry and Q. M. Crater, first; N. McCracken and Mark Powell, second; East-West, Edith Reid and Kay Morriss, first; Mr. and Mrs. Max Holley, second.

January 26 winners were North-South, Mary Anne Duttonhofer and Mark Powell tied for first with Wayne and Elizabeth Brewer; Edith Reid and Kay Morriss, second; East-West, Charlie and Jean Brown, first; Ray Lynch and Paul Swanzy, second.

Photo Club Sees Closeup Techniques, Programs For Next Two Meets Told

The regularly scheduled bi-weekly meeting of the Photographic Club was held in the east conference room of Building 1, February 4, with a demonstration of closeup photographic equipment and techniques by Ken Cashion.

Programs for the next two meetings were announced. At 7:30 p.m., Thursday, February 18, in Building 1, visitors and members are invited to bring color transparencies or black and white prints of closeups which they have taken of any subject.

Photos of members will be entered in point competition. A continuation of the demonstration and discussion of closeup techniques and equipment will be held. Also members will present results of their block assignments for point competi-

tion. The block assignments are made by throwing darts at a map of the Houston area with the location of the hit determining where the photo assignment is to be. Photos resulting from this type club activity have in the past provided a diversity of subject matter.

Members not present at the meeting when block assignments were made may contact Ken Cashion for their assignment.

The program for the March 4 meeting will be on portrait photography. Members and visitors are invited to bring samples of their work in this field.

For information on these programs, other club activities, or club membership, contact either Ken Cashion at Ext. 7673, or Fran Johnson at Ext. 5384.

MSC BOWLING ROUNDUP

MSC MIXED LEAGUE		
Standings as of Feb. 8		
TEAM	WON	LOST
Celestials	59½	20½
Virginians	52	28
Alley Cats	52	28
Chugg-a-Luggs	38	42
Shakers	38	42
Play Mates	38	42
Falcons	37½	42½
Gutter Nuts	37½	42½
Dusters	37	43
Eight Balls	36	44
Hawks	33½	46½
Goofballs	25	55

High Game Women: Barnes 225, Smith 192, Gassett 179.

High Game Men: McDonald 245, Morris 230 Schmidt, Zwolinski, Sargent, Morgan 221.

High Series Women: Barnes 575, Gassett 466, Morris 452.

High Series Men: Kelly 588, Sargent 580, Spivey 574.

High Team Game: Celestials 854, Virginians 840, Eight Balls, Shakers 823.

High Team Series: Celestials 2399, Eight Balls 2321, Chugg-a-Luggs 2286.

NASA 5 O'CLOCK MON.

Standings as of Feb. 8		
TEAM	WON	LOST
Foul Five	45	31
Suppliers	44	32
Computers	40	36
Hot Shots	38	38
Sombreros	34	42
Alley Gaters	27	49

High Game: W. Kutalek 244, M. Cohn 230, H. Erickson 224.

High Series: H. Erickson 595, E. R. Walker 591, H. Walker 569.

High Team Game: Computers 880, Foul Five 862, Suppliers 865.

High Team Series: Suppliers 2411, Foul Five 2341, Computers 2321.

MIMOSA MEN'S LEAGUE

Standings as of Feb. 4		
TEAM	WON	LOST
Fireballs	7	1
Technics	7	1
Sizzlers	6	2
Spastics	6	2
Whirlwinds	5	3
Roadrunners	5	3
Green Giants	3	5

Fabricators	1	7
Pseudonauts	0	8
Alley Oops	0	8

High Game: Grimwood 244, Petersen 244, Amason 233.

High Series: Morgan 629, Lee 645, Whipkey 603.

High Team Game: Fabricators 990, Alley Oops 975, Spastics 908.

High Team Series: Roadrunners 2681, Fabricators 2641, Spastics 2548.

MSC COUPLES LEAGUE

Standings as of Feb. 9

TEAM	WON	LOST
Schlitz	11	5
Alley Cats	10½	5½
Goofballs	10	6
Bltzf	10	6
EZ-GO	10	6
Pin Splitters	10	6
Bowlernauts	9	7
Wha' Hoppen?	7	9
Crickets	6	10
Thinkers	5	11
Sandbaggers	5	11
Hi-Ho's	2½	11½

High Game Women: J. Foster 228, K. Gentile 224.

High Game Men: D. Kennedy 244, J. McBride 242.

High Series Women: J. Foster 564, W. Townsend 510.

High Series Men: J. Garino 642, B. Jones 628.

NASA MIXED LEAGUE

White Sands Operations

Standings as of Jan. 14

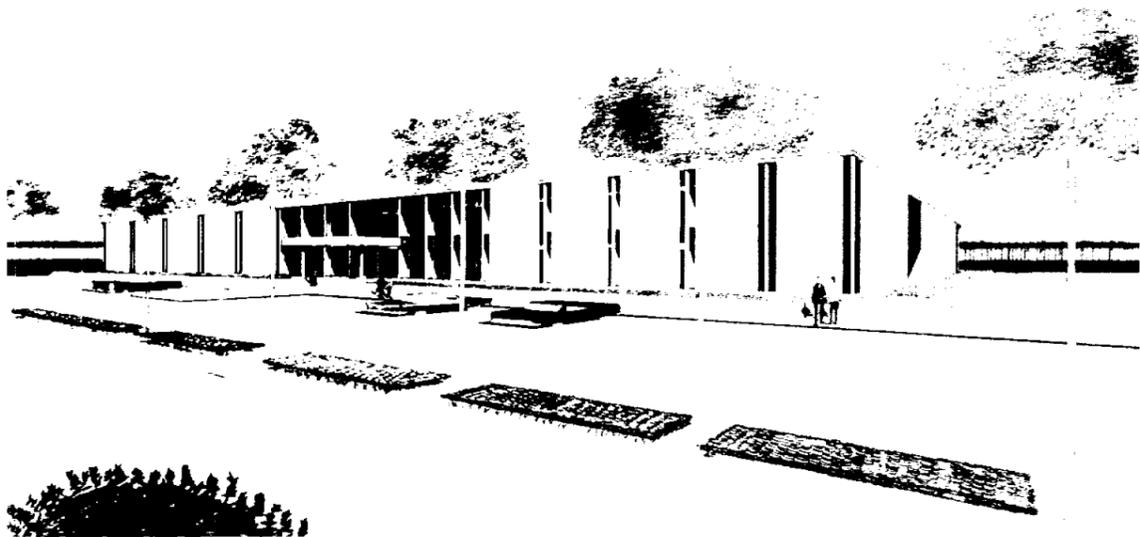
TEAM	WON	LOST
Goofballs	6	2
Bad Guys	5½	2½
Pinbusters	5	3
Woodbusters	5	3
Misfits	4	4
Roadrunners	4	4
Good Guys	2½	5½
Team Four	0	8

High Game: B. Colston 212, T. Matuszewski 211, B. Gantz 209.

High Series: T. Matuszewski 570, B. Colston 558, J. Winn 549.

High Team Game: Roadrunners 772, Goofballs 763, Pinbusters 763.

High Team Series: Misfits 2276, Pinbusters 2201, Roadrunners 2143.



NEW CLEAR LAKE FACILITY—Architect drawing of first structure of the TRW/STL complex which is now under construction across from the main entrance to MSC. This two story, 40,000 square foot facility will have a capacity for approximately 250 people. Scheduled completion date is July 1, 1965.

Hardware For MSC Programs

ultimate in safety as well as in flight performance.

STI-designed demodulator subsystems have been ordered by Collins Radio Company for the world-wide unified S-band ground station network being established for Project Apollo.

TRW is also currently developing a monolithic low-level telemetry amplifier for MSC. These high-precision operational amplifiers will provide a capability which is competitive with high quality chopper-stabilized discrete component amplifiers in gain, accuracy, drift-stability and common-mode rejection and yet clearly superior in regard to size, weight and reliability.

TRW Space Technology Laboratories is also doing studies for MSC on environmental material testing of fabrics for Apollo and Gemini space suits.

The purpose of these tests is to determine the thermal transfer properties of selected space suit assembly materials before and after exposure to a simulated space environment. These results will significantly affect the thermal control analysis of the space suit.

National attention was drawn to TRW when two major space events achieved their program objectives. On July 17, 1964, the second pair of Nuclear Detection (Vela) Satellites (NDS) was placed into orbit successfully along with an STL-developed Tetrahedral Research Satellite (TRS) riding piggyback.

All three spacecraft are now performing as specified, with the NDS maintaining space sentry duty, along with the first pair launched in 1963, ever watchful for artificially produced nuclear explosions. The TRS meanwhile, is collecting valuable data on the effects of the space environment on materials attached to its surface.

The second major space event, on Sept. 4, 1964 was the successful launching of the first Orbiting Geophysical Observatory (OGO), designed and manufactured by TRW-STL for NASA's Goddard Space Flight Center.

Considered by NASA as the most advanced and versatile scientific spacecraft ever launched, the 18 experiments aboard the OGO are now collecting useful data on phenomena in

the regions of space out to 90,000 miles from the Earth.

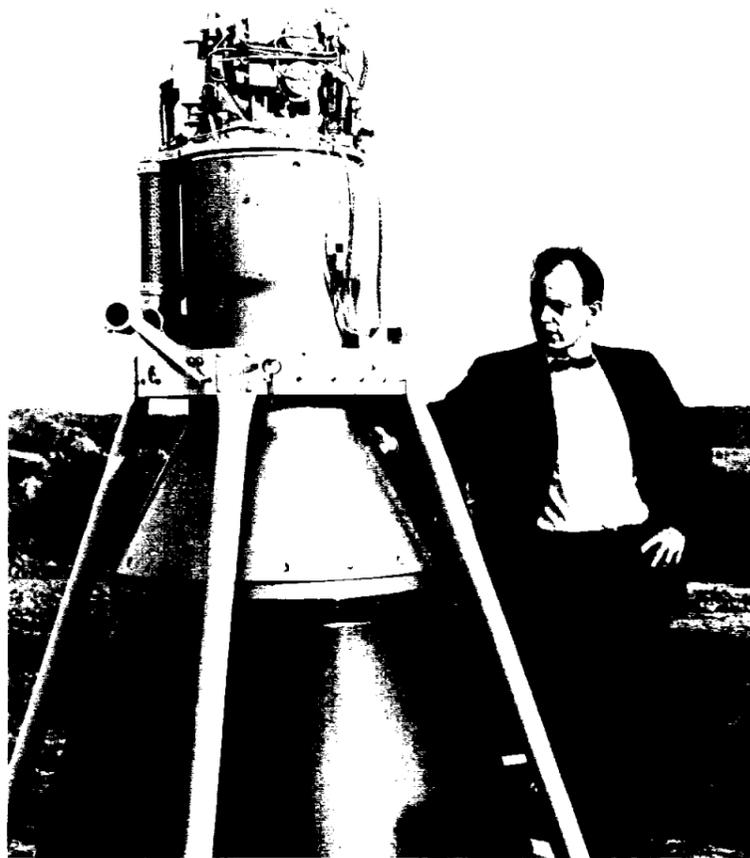
Meanwhile work is progressing on the next OGO to be launched in 1965 and two additional spacecraft.

TRW Space Technology Laboratories has played a major role in more than a score of major ballistic missile and space programs since its inception in 1954.

Acting as scientific advisor to the U.S. Air Force, it provided technological leadership for the development of the first intermediate-range and intercontinental ballistic missiles, THOR and ATLAS, and spearheaded the development of three later generations of missiles—Titan I, Titan II and Minuteman.

Other achievements include the design and manufacture of Pioneer 1, NASA's first interplanetary spacecraft... the installation of Span, the first worldwide network of tracking stations... and Pioneer 5, the first spacecraft to return scientific data from deep space (22 million miles).

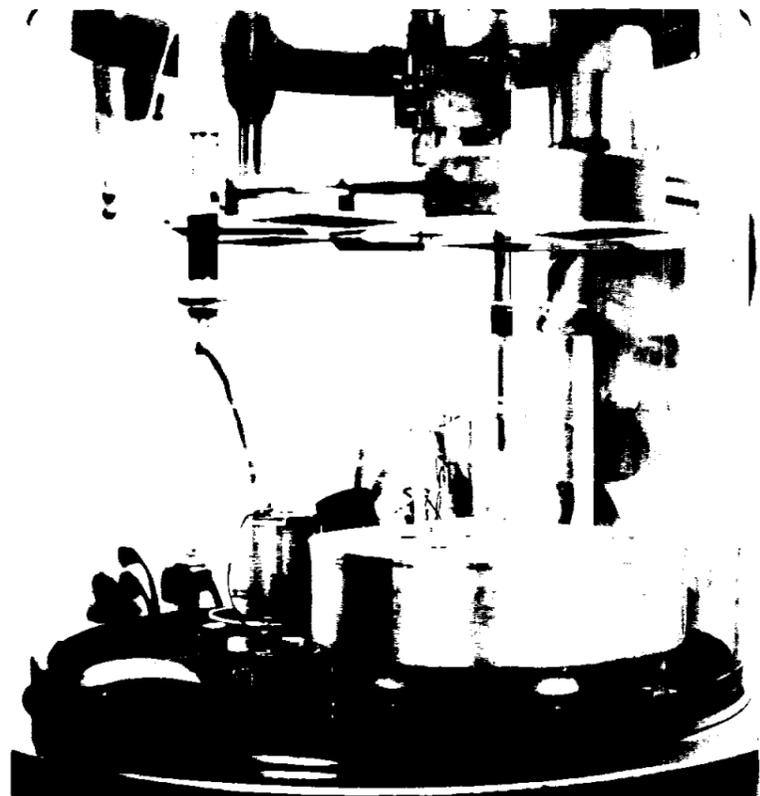
These are the past and present achievements of TRW Space Technology Laboratories. Still to come are more launches of OGO and the first launch of the new interplanetary Pioneer; and, in support of the Manned Spacecraft Center, the maiden flights of Gemini and Apollo.



LEM ENGINE PROTOTYPE—Prototype model of variable thrust engine being developed by TRW Space Technology Laboratories. Development, under the direction of Arthur F. Grant Jr. (shown here), is for the lunar excursion module (LEM) of the Apollo Spacecraft.



QUALITY CONTROL—Test engineer is shown checking solar panels in clean room. This is part of the extensive quality control program at STL.



STL LABORATORY—Specialized laboratories are located in R & D buildings at Space Technology Center, Redondo Beach, Calif. Here experimentation is conducted in thin film superconductivity in vacuum environment.



COMPUTATION CENTER—Two complete IBM 7094 computers are used in STL's Computation Center. Major economies in time and money are affected through the use of computers to conduct simulations of subsystems and system performance during the research and development stages of weapons and space systems.

The SPACE NEWS ROUNDUP, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

Director Robert R. Gilruth
 Public Affairs Officer Paul Haney
 Editor Milton E. Reim
 Staff Photographer A. "Pat" Patnesky

On The Lighter Side



Is There A Cook In The House?

Any cooks around that would like to whip-up a pound cake like the ones that are to be carried by the astronauts on the moon trip?

In the request for proposal (RFP) No. BG 721-60-5-478P, the development program to provide food for Apollo and LEM space vehicles, the following recipe is given for bidders to follow. The recipe is for pound cake, bite size, and is from the "Space food prototype production guide No. 31," U.S. Army Natick Laboratories, Natick, Mass.

Shortening, emulsified, 100 hr.	11.8
Sugar, granulated	26.3
Lemon peel, grated	0.4
Lemon Juice, fresh	1.6
Whole Milk Liquid	16.6
Vanilla Flavoring	0.5
Flour, general purpose	26.3
Salt	0.5
Chemical Leavening	0.3
Fresh Shell Eggs	15.7
TOTAL	100.0

Analytical and bacteriological requirements, instructions for baking, and methods of testing and packaging the cake, are specified in four typed pages.

Another production guide uses five pages to detail the instructions for making a space peanut butter sandwich. And it used to be a simple chore when they were made only for earth consumption.

It is reasonable to assume that the pound cake will turn into a very delectable dessert, especially if one has the proper instruments for arriving at the correct proportions of the necessary ingredients.

However, if home cook books of today specified ingredients as above, one would almost have to

be an analytical chemist to bake a cake.

Cake for the Apollo and LEM space vehicles will no doubt be very tasty, but, will it be "just like Mom used to bake?" It couldn't be!

SPACE QUOTES

SPACE EXPLORATION: THE CHALLENGE AND THE PROMISE. Address by NASA Administrator James E. Webb, Commercial Club of Chicago, Dec. 21, 1964.

"Space exploration is raising mankind's vision. It is stimulating and releasing creative energy in many vital areas of human endeavor, much as the Renaissance swept open the horizons of Western man and set off an intellectual ferment that led on to the scientific and technological revolution the world is experiencing today.

"Until 1957 it had occurred to few people that man could go beyond the atmosphere of the Earth. It was widely believed that space would forever confine man to the planet of his origin. But during the past few years we have learned that the space barrier can be crossed, as Columbus and Magellan sailed over oceans believed to be impassable.

"From our space successes men everywhere can draw courage to attack other so-called impossible problems. If man is ingenious enough to go to the Moon, he may be inspired to find the way to lasting world peace and the means to eliminate disease, hunger, poverty, and ignorance."

Welcome Aboard

Forty persons joined the Manned Spacecraft Center during the last reporting period.

Procurement and Contracts Division: Jerry D. Haptonstall.

Engineering Division: Clarence D. Council, Eugene C. Hajdik, and Thomas P. Kromis.

Facilities Division: Victor L. Houston.

Flight Crew Support Division: Charles R. Idol, K. Duane McLain, and Dale A. Nussman.

Information Systems Division: Carroll T. Dawson, Gordon A. Jaegers, and Sidney W. Novosad.

Crew Systems Division: Philip C. Johnson Jr., and Michael N. Rouen.

Computation and Analysis Division: Ervin O. Grice, and J. Mayne Lewallen.

Instrumentation and Electronic Systems Division: William F. Ritz.

Guidance and Control Division: Terry D. Humphrey and Lee V. Kennedy.

Propulsion and Power Division: Hugh W. Coleman, Stephen C. Garton, Carroll E. Mayhew, Ben E. Salisbury, and Allen A. Wicke.

Structures and Mechanics Division: Jerry H. Graves, and John V. Herring.

Advanced Spacecraft Technology Division: Edmond B. Chambliss, and Edward A. Haley.

Flight Control Division: Joe F. Martin.

Assistant Director for Flight Operations: Anne G. Sabin.

Flight Control Division: John W. Summerford.

Mission Planning and Analysis Division: Hector Garcia, Chester Hancock, Nancy L. Key, and Ted L. Turner.

MSC PERSONALITY

Velma De Busk Manages Center's Mail And Records

Velma De Busk, chief, MSC's Paperwork Management Office, began her government career in February of 1941 as a clerk-stenographer in the office of the inspector general, War Department, Washington, D. C.

She recalled that her first and her latest place of government employment was with an agency that was housed in temporary quarters at the time of her coming on board.

At the time she joined the War Department, that agency was quartered in temporary buildings awaiting construction of a permanent headquarters, as was the situation when she joined MSC in May of 1963.

Velma also took part in the early formation of the Marshall Space Flight Center, Huntsville, Ala. She was part of the nucleus of government employees that helped with the organization of MSFC in 1960, before it officially became a NASA Center.

In her current assignment, which she assumed in March of 1964, her duties include the responsibility for management of records, reports, and mail at MSC. She also has supervision over all mail and records functions, the Administrative Directive Library, publications and forms distribution, and the records holding area. The latter being where inactive MSC records are warehoused prior to

Flight Support Division: Ronald E. Mari, and Cornelius J. Sullivan.

Gemini Program Office: Billie E. Johnson.

MSC-Florida Operations (Merritt Island, Fla.): Joel V. Fears.

Apollo Spacecraft Program Office: Dennis H. Johnson, and James W. Mistrot.

being sent to a federal records center.

When Velma left the War Department in March of 1943, she joined the Red River Ordnance Depot, Texarkana, Tex., and was there until joining NASA in



VELMA DE BUSK

1960, with the exception of one year at the Lone Star Ordnance Plant in 1955, also located at Texarkana.

While at the Red River Depot, she served as the assistant to the chief clerk of the depot in the management of mail and records, telecommunications, library, and reproduction facilities. She also had the responsibility for all correspondence with the personnel division and the preparation of the correspondence manual for the depot.

Being a teacher was also one of her duties, teaching correspondence training courses to the secretaries, typists and stenographers at the depot.

In May of 1960 she transferred to MSFC as a management analyst in the Administrative Services Branch, where she worked on management surveys and analysis of administrative regulations and procedures at the Marshall Center.

Velma joined MSC in May of 1963 as a management analyst in the Management Analysis Division, and assumed her present duties in March of last year.

She was born in Bigelow, Ark., and completed her formal schooling at Little Rock, Ark., Senior High School. Her home is in LaPorte, Tex.

Velma has a daughter who is married to Cecil Messer, who is employed at MSC in the Advanced Spacecraft Technology Division.

Asked if she had grandchildren, Velma said that she was the very proud grandmother of a little girl named Lise who is soon to be three years old.

She, her daughter, and son-in-law, at one time, all worked at MSFC in Alabama. The daughter and her husband preceded Velma's arrival at MSC in Houston.

Velma said her hobbies or outside activities include gardening and doing yardwork around her home.

Space News Of Five Years Ago

FEB. 18, 1960—Mercury remote-site flight controllers were appointed, and training was inaugurated by a series of Space Task Group lectures that covered facilities, network systems, operations, and other details. In addition, a program was established for familiarization, orientation, and specialized instruction of the Department of Defense group of aeromedical staff personnel designated as members of flight controllers teams.

FEB. 22, 1960—Tests were completed on the Mercury spacecraft automatic stabilization and control system.

FEB. 26, 1960—The establishment of Project Mercury tracking networks in Australia was sanctioned by joint agreement.

FEB. 27, 1960—Design approval and reliability tests of the Mercury command receivers were completed.

—A 100-foot-diameter inflatable sphere was successfully launched on third suborbital test, to an altitude of 225 miles, from NASA Wallops Station, Va.

FEB. 29, 1960—The Space

Task Group placed a requirement with NASA Headquarters for the purchase of an analog computing facility. Planned use of this facility was to establish and verify Mercury system requirements; it also could be used for Mercury follow-on programs such as a manned circumlunar vehicle program and other outer space program requirements of this nature. Cost of this facility was estimated to be \$424,000.

During the month of February —As a part of their training program, the astronauts received two days of instruction in star recognition and celestial navigation presented by Dr. James Balten at the Morehead Planetarium in Chapel Hill, N. C. The purpose of this training was to assist the astronaut in correcting spacecraft yaw drifts.

February and April—Agreements were signed with two Spanish firms to provide communications at the Grand Canary Island Mercury tracking site.

MARCH 1, 1960 — The House Science and Astronautics Committee voted \$915-million for NASA in fiscal year 1961.

Six Degree Of Freedom Unit To Simulate Zero And Lunar Gravity Motion Problems

A new device for simulating some of the motion problems experienced in zero and lunar gravity is undergoing checkout in the Manned Spacecraft Center's Crew Systems Division.

Called the six degree of operational freedom simulator, the device consists of two 12-foot booms with ballast buckets, and a personnel cradle. Through the use of ball bearing joints and a gimbal system, a test subject can achieve 360-degrees rotation in roll, pitch and yaw. He can move nine feet vertically, and has a horizontal range 24-feet in diameter.

The feeling of weightlessness comes from balancing the man's weight exactly with lead weights in the ballast bucket. Since his body has no "weight," he has full freedom of motion. How-

ever, it is a suspended type of weightlessness rather than the free fall weightlessness of outer space. The test subject will only have total body weightlessness.

The simulator will be used for evaluating such items as space tool concepts and spacecraft tethering lines. It can give a continuous and long term weightless simulation. An aircraft only attains 20-30 seconds flying gravity cancelling parabolas. Special problems arising from simulator work can be validated by the Air Force C-135 aircraft.

In zero "g" simulations, the subject is strapped firmly in the personnel cradle. He cannot move his legs or torso. His arms are free to provide torque by pushing away from a spacecraft, pulling a tethering line, or using

a tool.

When the device is balanced to provide one-sixth gravity, a bicycle seat is substituted for the lower half of the personnel cradle. The suited man is then able to practice walking under the reduced gravity conditions.

A ventilation and breathing line runs through the simulator to the personnel cradle, where it can be attached to the man's pressure suit.

Project engineer for the simulator is Earl LaFevers and Jack Slight is principal test subject for the device.

Centrifuge Building Administrative Wing Accepted For Occupancy

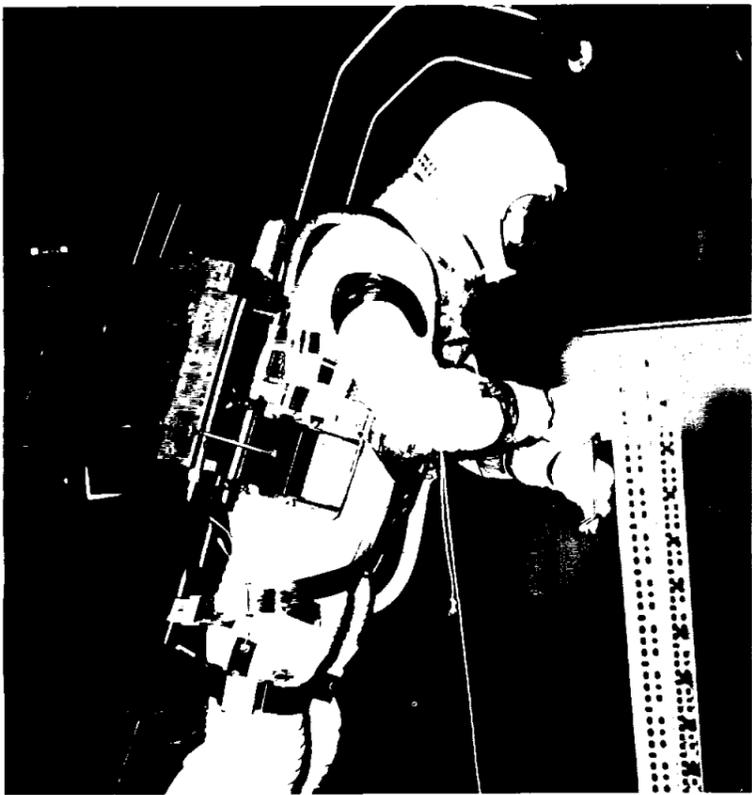
The administrative wing of Building 29, containing 17,000 square feet, was accepted for occupancy January 19 by the Manned Spacecraft Center.

Housed in the circular portion of the building, is the centrifuge which is 75 per cent complete. Acceptance tests on the centrifuge arm, gondola, and motor assembly are not scheduled to begin for several months.

The centrifuge is designed to produce the effects of high acceleration on test subjects, who ride in the gondola on the end of a 50-foot rotating arm. The forces which build up during launch and reentry of a spacecraft can be simulated inside the facility.

MSC's centrifuge gondola can carry three men, effectively simulating the environment of an Apollo lunar mission.

Flight Acceleration Branch of Crew Systems Division, recently moved into the new building. They had been located on the second floor of Building 4, prior to the move. The General Accounting Office, now located at Ellington AFB, is scheduled to move into the vacated office space in Building 4.



SIX DEGREE OF FREEDOM—John B. "Jack" Slight, project engineer and test subject on the six degree of operational freedom simulator, demonstrates the difficulties of using conventional tools in a zero gravity environment.

Kentucky Governor Visits Center



KENTUCKY GOVERNOR—A recent visitor to the Manned Spacecraft Center was Gov. E. T. Breathitt of the state of Kentucky. Here he chats with George M. Low, deputy director of MSC, who explains to the governor some points about the Gemini spacecraft.

Lubbock Editor Visitor At MSC



LUBBOCK VISITOR—T. J. Harris (left), editor of the Lubbock (Texas) Avalanche-Journal, a recent visitor to the Center, is shown with Paul E. Purser, special assistant to the director, who points out the various Center buildings as seen from his office on the ninth floor of the Project Management Building.

Foreign Scientists Invited

Biomedical Conference To Be Here

The National Aeronautics and Space Administration has invited more than 130 foreign scientists to a conference to aid them in proposing biomedical experiments on U.S. manned space flights.

The conference, to be held at the Manned Spacecraft Center, April 22, 23, will be devoted to a briefing of the Gemini and Apollo missions as they relate to the identification and design of appropriate biomedical experiments.

Both of NASA's manned

flight programs, Projects Gemini and Apollo, have been opened to proposed experiments by the world scientific community. Proposals will be considered on the basis of their scientific merit in competition with other proposals. The conference will be under the direction of Dr. W. Randolph Lovelace II, director of Space Medicine for NASA.

Letters of invitation have been sent by NASA's Office of International Affairs to 113 scientists and 23 national space organizations overseas.

Quality Assurance People Meet At MSC

On January 19 and 20 the Manned Spacecraft Center was the site for a joint NASA/Government Agency Meeting for nearly 100 Quality Assurance people representing a large portion of the Government Agencies working on the Apollo Spacecraft Program.

Purpose of the meeting was to provide the agency representatives a briefing of the status of the program and acquaint them with certain Apollo reliability and quality assurance policies and programs.

William L. Baldwin of the ASPO-R&QA Division was chairman of the two day session which was held in the Auditorium (Building 1). A welcome address to set the keynote for the meeting was delivered by Dr. J. F. Shea, ASPO manager.

Presentations covering program status and new manufacturing and inspection techniques were given by:

H. Fritz, chief, Quality Assurance Branch, Downey; J. Johansen, chief, QAB, Bethpage; R. Langnau, chief, QAB, Boston; L. Lewandowski, AST, QAB, Milwaukee; R. Steele, Crew Systems Division; and J. Dunaieff, chief, Quality Assurance, Daytona Beach.

An explanation of training programs available at the NASA School of Reliability and Quality Assurance at Huntsville, Ala., was given by H. Schrimsher, of Marshall.

J. Jones of the MSC-R&QA Office described quality problems encountered during the first manned spacecraft flights in the Mercury Program.

The first day's activity was concluded with a panel discussion on the subject of NASA quality publication NPC 200-1A, Quality Assurance Provisions for Government Agencies. Panel members were: R. Cromwell, MAR-Q, NASA Hq.; D.

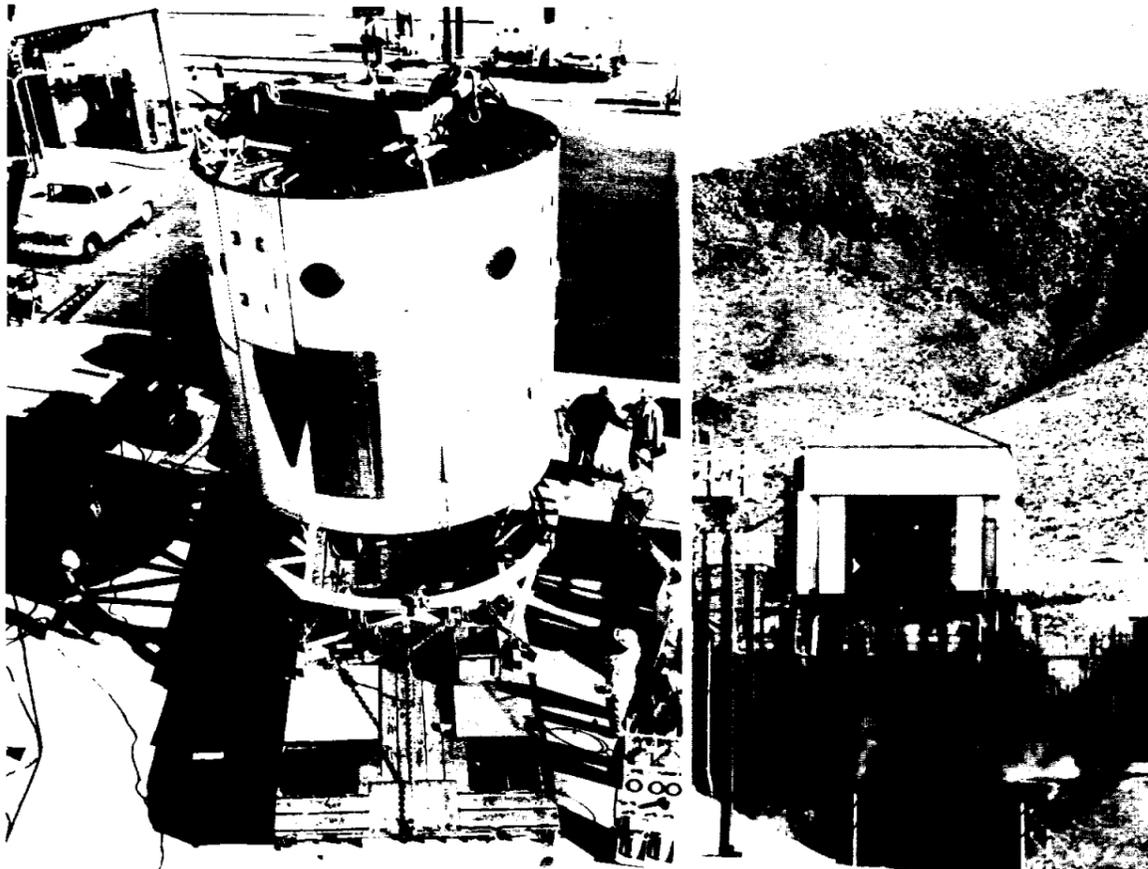
Negola, KR, NASA Hq.; H. Weiss, KR, NASA Hq.; and Baldwin, Fritz, Johansen, and E. Smith of ASPO-R&QA.

The final day's proceedings began with a description of the Government Agency's responsibilities during development, qualification and acceptance tests presented by M. Steintal of the ASPO-R&QA Division.

Requirements for the government agency quality assurance plan were presented by R. G. Chadwick, GE; a description of the acceptance data package was given by S. Heilveil, GE; and G. E. Wood, GE, discussed the ASPO-R&QA audit program.

Astronaut C. C. Williams concluded the formal portion of the program with an inspiring talk on the role of the government agency as seen by the astronauts.

The meeting concluded in the afternoon with a tour of the MSC facilities.



SERVICE MODULE—The first flight-type service module constructed for Project Apollo testing is lifted from its shipping dolly (left) for installation in Test Stand Two at MSC-White Sands Operations in New Mexico. The 10-second firing of the Service Propulsion Subsystem (SPS) of the service module is shown at right.

Apollo Service Module Undergoes First Shakedown Test At WSO

The first major piece of actual flight-type hardware for America's manned lunar exploration program, Apollo, underwent its shakedown test February 5, at the NASA Manned Spacecraft Center's White Sands Operations in New Mexico.

The flight-weight Service Module segment of the Apollo spacecraft was fired for 10 seconds in the Propulsion Systems Development Facility (PSDF) at White Sands.

The static firing of the Service Propulsion Subsystem (SPS) engine began a test series designed to help determine the flight readiness of a similar Service Module programmed for the first tests of flight-type Apollo hardware from Cape Kennedy next year.

The tests at PSDF will ultimately verify flight profiles for each subsequent Service Module flight, including the trip to the moon. The SPS engine's 22,000 pounds of thrust will slow Apollo down for entry into lunar orbit, and speed the spacecraft up for

escape from lunar orbit, and the return trip to earth.

Future tests will include the reaction control system or small guidance engines used to maneuver the spacecraft, and the electrical power system with its energy-converting fuel cells.

The airframe is a lightweight structure, including flight-weight propellant tanks, as contrasted to the thick-walled tanks and plumbing of the boilerplate system on which engine development tests have been conducted at the PSDF since September.

It also will include the reaction control and electrical power subsystems not found on the boilerplate. The engine is an updated version of one used in developmental tests.

Static firings in the develop-

mental series will continue with the boilerplate system on Service Module Test Stand One. The airframe tests will be conducted on SM Test Stand Two. Three other static test stands at the facility, two of them capable of simulating altitudes to 250,000 feet, will handle Lunar Excursion Modules engine firings beginning this spring.

Continuation of the Service Module airframe testing will integrate the service propulsion and reaction control systems prior to the flights from Cape Kennedy. Mission profiles verified at PSDF for later flight tests of the spacecraft will include intentional deviations from normal operation to establish tolerance to and corrective actions for such incidents.

Prime contractor for the Apollo command and service modules is North American Aviation, Inc., Space and Information Systems Division, at Downey, Calif. The Aerojet-General Corp., of Sacramento, Calif., builds the SPS engine.

The service module weighs about 10,000 pounds without fuel, and just under 50,000 pounds when fueled. Its multiple-restart propulsion engine burns a half-and-half blend of hydrazine and unsymmetrical di-methyl hydrazine fuels with nitrogen tetroxide as an oxidizer. The propellant combination is hypergolic — ignites spontaneously when mixed.

Dimensions of the service module, to be located directly behind the three-man command module in the Apollo spacecraft stack, are 13 feet diameter and 13 feet height, not including the engine nozzle extension.

ing the final minutes before hitting the Moon.

SA-9 was to have orbited the Pegasus meteoroid detection satellite that was contained in a specially modified Apollo service module. The Apollo command and service module and launch escape tower was to have been jettisoned in orbit and Pegasus was to have deployed and remain attached to the S-IV stage and instrument unit.

With a satisfactory orbit, the Pegasus satellite is expected to remain in orbit for at least a year.

The SA-9 launch will also further verify the launch vehicle and spacecraft configuration.



SECOND FRONT PAGE

Dr. Harry Reynolds Named Assistant Manager Of Apollo

Dr. Harry L. Reynolds, former head of the Nuclear Propulsion and Experimental Physics Divisions at Lawrence Radiation Laboratory, Livermore, Calif., has been named assistant manager of the Apollo Spacecraft Program Office.

Reynolds, 39, will work closely with Dr. Joseph F. Shea, manager, and Robert O. Piland, deputy manager of ASPO, in the overall management of the spacecraft program.

He had been director of the Pluto nuclear ramjet program at the Lawrence Laboratory of the University of California where he was employed for nine years. The Pluto program was cancelled last July after successful ground operation of flight-type reactors at Jackass Flats, Nev. The joint Air Force-Atomic Energy Commission program was halted for lack of a clear military need for the nuclear ramjet.

While at Livermore, Dr. Reynolds was also involved in advanced nuclear propulsion and electrical power systems for spacecraft.

A native of Port Chester, N.Y., Reynolds was graduated from Central High School at Purdy Station, N.Y. He served two years in the U.S. Navy during World War II, including duty aboard a destroyer escort. He was an electronics technician.

He received his Bachelor of Science degree in physics from Rensselaer Polytechnic Institute, Troy, N.Y., in 1947, and won his Ph.D. in physics from the University of Rochester, N.Y., in 1951. His thesis dealt with cosmic radiation.

He did studies in nuclear reactions at Oak Ridge National Laboratories in Tennessee before joining Lawrence Radiation Laboratory in 1955. His first assignment at Lawrence Labs was on the Rover nuclear rocket program. He moved to the Pluto program in 1957.

Dr. Reynolds has written

more than 30 technical and scientific papers, including about 20 published in the *Physical Review*, the journal of the American Physical Society.

He presented a paper in 1958 at the Second Geneva Con-



DR. HARRY REYNOLDS

ference on peaceful uses of atomic energy in Switzerland on "Critical Experiments on Propulsion Systems," and another on the Pluto program before the Australian Atomic Energy Commission conference in Sydney in 1963.

Reynolds and his wife, the former Katherine Haile of Savannah, Ga., live in El Lago, with their two daughters, Patricia 10, and Margaret 7.

An outdoorsman, Reynolds is a member of the Sierra Club of California, and is devoted to skiing and mountain climbing, hobbies he admits are challenging to pursue in snowless, mountainless South Texas.

He is also a Fellow of the American Physical Society, a member of the American Nuclear Society, and a member of Sigma Xi, an honorary scientific society.

Address Is Determining Factor In Speeding Mail To WSO

If you have had occasion to send mail to the MSC-White Sands Operations in New Mexico lately and maybe experienced a delay in receiving a reply, there is a very good possibility that you addressed the envelope wrong.

This happens very often and causes a delay in the delivery of mail to the White Sands facility, according to D. G. Kanoff, head of the Administrative Support Office, MSC-WSO.

If you still address mail to NASA-MSC White Sands Missile Range, N.M., he said you can anticipate at least a two day delay in the delivery of your mail. Mail addressed thus, must be processed through the Army Postal Facility and then back through the U. S. Mail system again before reaching its destina-

tion.

Kanoff supplied this mailing address for those who would like a surer, swifter and straighter route — MSC-White Sands Operations; P. O. Drawer MM: Las Cruces, N.M. 88001. And to speed things up even more he said, "Please, put the person's name and routing symbol on the envelope."

A list of all the White Sands Operations routing symbols may be found on page eight of the current MSC telephone directory.

SA-9, Ranger C Launches Scheduled For This Week

Two launches that will send spacecraft into space, to help pave the way for manned missions to the Moon, are scheduled this week at Cape Kennedy, Fla.

The Saturn-Apollo 9 (SA-9) flight was to have been launched sometime between 8:30 and 11:30 a.m. EST, yesterday, to place the first Pegasus satellite into Earth orbit.

Today, between 12:05 and 2:05 p.m., the launch window is open for a scheduled launch of the Ranger C spacecraft on a 65-hour flight to the Moon.

If successfully launched today the spacecraft will be named Ranger VIII. The single experiment carried by the 800-pound spacecraft will consist of six television cameras that could provide more than 4000 photographs of the lunar surface dur-